

03/10/1988: NEWS FEATURE

1 SOURCES

1.1 Stewart Alsop "Why You Shouldn't Buy 80286 Machines Anymore"
PC World 12/87 p63

TEXT

"Is the computer industry telling the truth? With IBM and Microsoft in the lead, the industry has been telling us that it's okay to buy computers based on the 80286 processor because it will remain the mainstream processor for years to come.

On the surface, the industry would seem to be telling the truth. After all, computer manufacturers and software developers understand the 80286. It's been more fully tested and debugged than the 80386; it's been licensed by Intel, which means that multiple sources provide competition, driving prices down; and, generally speaking, it seems adequate in both speed and design.

The problem is that most of the people who run the leading companies in the industry would privately admit that the 80286 is, to paraphrase Steve Jobs, a brain-damaged processor.

You can't really blame Intel for the mistakes it made with the 80286, since the chip's basic design was set even before IBM

introduced the original PC. And Intel couldn't have foreseen how popular that computer would become and how important upward compatibility would prove to be. But when it designed the 80286, Intel made a basic mistake. It gave the 80286 two incompatible operating modes: real mode (which means that it operates the way an 8088 or 8086 operates, but with a more efficient design) and protected mode (which means that it operates completely differently than the 8088 or 8086). Real mode was intended to maintain compatibility with DOS; protected mode was intended for more powerful operating systems like UNIX. The problem is that real mode doesn't give DOS a way to acquire new features or capabilities, yet DOS can't be used in protected mode without being completely rewritten.

There are two ways to solve this problem. Either you accept the 80286 for what it is and design a new, incompatible operating system that can still somehow run old applications as they are run today. Or you fix the chip that caused the problem in the first place.

When Intel set the specifications for the 80386 chip, it decided that it might as well fix the original problem. So it gave the 80386 four different modes: two to maintain strict compatibility with real mode and 286 protected mode and two more to provide a growth path---the 386 protected mode and a new virtual 86 mode. The virtual 86 mode is fascinating: it allows DOS to be extended so

that multiple sessions of DOS can run at once. That means users can work with more than 640K of memory and run more than one task at the same time under different copies of DOS.

More important, virtual 86 mode exists on 80386 along with protected mode. As far as I can tell, the 80386, along with the appropriate system software (such as Desqview, Windows 386, or PC-MOS/386), would allow you to begin using more than one of your existing programs at a time. It would let you grow into using a real, protected, multitasking operating system without forcing you to give up your old software, which is what OS/2 requires. But that's at least three years off. By 1990 or so, you would have one operating system (something like OS/2 integrated with a control program like Desqview, Windows 386, or PC-MOS/386) that would permit multiple, isolated sessions of DOS, each running a single DOS application, and also encompass an integrated, protected, multitasking operating system that would run new applications with great new features and capabilities. That would give you the benefit of using multiple, existing applications while gradually adopting new applications that run in the multitasking system.

But, for a variety of reasons, IBM decided to accept the flaws of the 80286 and base much of its product development and marketing strategy on machines designed around that chip. IBM has done that, I think, because it doesn't want to admit that it made a mistake in

introducing the original 80286-based machine, the PC AT, or that it sold a flawed machine to nearly a million people. As a result, IBM is in the process of introducing a largely incompatible operating system: OS/2. This operating system will require anybody who wants to use the new applications that are being developed for it to switch from DOS to OS/2, replacing all of their DOS applications with those written for the new operating system.

Although most users won't really need to make that switch for several years, this basic conflict is causing anguish among those who have to plan major purchases for companies and those who are designing software products for delivery in the next year or two. In essence, it seems that IBM's decision to continue to focus on the 80286 processor as the mainstream chip isn't gaining the support of the industry. Consider these two facts:

<> Microsoft itself is no longer buying 80286 computers. And it is passing those it already has down the line, so that the kind of computer considered mainstream at most companies is now considered obsolete at the company most responsible for developing the machine's system software.

<> Compaq, the company responsible for defining PC compatibility, is working as fast as it can to become the first company to sell mostly 80386-based computers, even though 80 percent of the computers it sells today are built around the 80286 processor.

Compaq also recently announced an agreement with Microsoft to bundle Windows 386 with its new 386 systems for a limited time.

Even Pete Peterson, executive vice president (sort of chief operating officer) at WordPerfect, wonders why IBM is requiring its users to upgrade to an incompatible operating system (OS/2) instead of providing a compatible hardware upgrade path. "If Apple can produce a hardware upgrade to make a IIe into a IIGS, then IBM should be able to offer a hardware upgrade for ATs, 30s, 50s, and 60s," Peterson says.

You know what I would do if I were responsible for buying PC compatibles for my company? I would follow Microsoft's lead. Unless you're really stuck on IBM, you can find good, solid 80386-based computers for decent prices from companies like Dell Computer or Tandy. If you're willing to pay a premium, you can get very-high-performance 386 machines from Compaq and AST Research. And you can also get 386 machines with a new, theoretically high-performance bus from IBM itself, although the company doesn't currently sell a desktop version of its 386-based Model 80.

With any of these machines, you will be protected no matter what direction the industry takes. If OS/2 never gains major applications support (most big software companies are developing

for the new system, but they may not make the right kind of software), you will still have a machine that can use control programs to run multiple copies of DOS. If OS/2 does become the wave of the future, it will run just as well on the 386 as on the 286. and you will be ready when Microsoft delivers the next generation of OS/2, which will be specific to the 80386 processor and run in 386 protected mode.

The bottom line is that by paying a little bit more, you can make sure that you don't get stuck in the future with a machine that doesn't cut it. You can get a machine that you know will do what ever you want done, no matter which way the operating system wind blows."

1.2 Eric Bender "Why Buy a PS/2?" PC World 12/87 p278

TEXT

"IBM's top scientists tell why they think the Personal Systems/2 represent the ideal platrorm for tomorrow's software

If the Personal System/2 line really represents the next generation of PCs, why od the diverse benchmarks provided by National Software Testing Laboratories and other groups all show IBM's new machines running deep in the pack of the current generation?

PS/2 development head Dennis Andrews stoutly defends his machines' performance using today's software, insisting that the question misses the main point by ignoring upcoming needs. "As applications get more complex, you're not interested in how fast you run Lotus. You're interested in how fast you run Lotus when you're already moving communications files, and you're also hot-keying to your calendar, and you're running something else in the background."

Unlike classic PCs, PS/2s were born to fill this demanding role, says Andrews, director of Entry Systems Division's Boca Raton laboratory. A few years from now, he adds, the PS/2's new Micro Channel Architecture (MCA) will shine even more brightly in "a lot of multiuser environments, which have complex servers and gateways and things that require additional processors or complex subsystems."

The PS/2 Models 50 and 60 with the MCA bus shipped in April, and in late summer third-party board suppliers began filling in the slots. But most of the benefits of the new architecture won't really show until next year when Operating System/2 applications begin to arrive.

According to its creators, the new PS/2 bus architecture is just one element of a broader framework of hardware, operating system software, and applications that IBM is building to support

tomorrow's multitasking. Among the PS/2's promises are greater reliability, clean specifications for a solid hardware/software foundation, and new capabilities such as support for multiple processors. And, of course, the new architecture offers the potential for more compact designs and good old-fashioned turn-up-the-clock-rate performance boosts.

New Threads For A Bus Driver

1.3 John Dvorak "Et Tu, OS/2?" PC Magazine 11/24/87 p71

TEXT

"The battle lines are drawn between two distinct groups in the PC community. OS/2 da! OS/2 nyet!

This battle is no small skirmish, either. The OS/2 controversy focuses on two issues. Issue number one is its use of the 80286 instead of the 80386. The second issue is the price. Everything else---performance, size, windows, etc.---is secondary.

Let's start with the chip issue. We always have to remember that the chip of choice is the 80386. Why? Because in protected mode (the mode with all that directly addressable memory) it will run

8086 code without modification. The 80286 will not. So you can't run your favorite old software under OS/2 unless you go into the so-called compatibility box (rhymes with penalty box "for high sticking!") and run it as a standalone program exactly as though you were running under DOS. You get none of the OS/2 benefits, no multitasking, no nothing. Why bother to change to OS/2 if this is the case? Well, it's assumed that you'll trash all your old software and spend extra dough for OS/2-compatible software, which will undoubtedly be more expensive than DOS software because the market for OS/2 is limited to the well-heeled Fortune 500 user.

The irony of the predicted high prices of this new generation of software is that OS/2 provides tons of programmers' tools that should make programming easier and thus lower the price of OS/2 software. Are things starting to smell a little rancid just about now?

The real gotcha to this scene, though, is seldom discussed by the micro world: Systems Application Architecture, better known as SAA. This is IBM's new programming-rulebook / user-interface / universal-compatibility solution. The idea is that with a rigid structure of standard calls, routines, and rules, a program that is SAA compatible will run exactly the same on a PC AT as it will on the big mainframe. Furthermore, a spreadsheet program will have the same interface as a database program if both follow the SAA

rulebook. Even the graphics will be universal, using the IBM mainframe GDDM graphics standard, which is the kernel of OS/2's presentation manager! IBM has made SAA one of its top priorities in the years ahead. The company has determined that OS/2 will be the beachhead for its first implementation of the SAA solution.

Because the 80386 impinges on the performance of its mini-mainframe (aka the 9370-20) and its System/36 and System/38 minis, IBM chose to have Microsoft design OS/2 to be an 80286 operating system. This is especially important when one sees the impact of SAA, which will create program compatibility up and down the IBM line. Heaven forbid the grand scheme would eat into the high profits of the heavy iron! Then, to make sure that only the big boys get to play in this arena, they price OS/2 beyond the budget of the single user or even the budgets of most small businesses. Even if they could afford it, can they afford to toss out all their applications and buy new, more-expensive ones?

Well, we sure wouldn't want a bunch of everyday hackers sticking their noses into all this, would we? Heck, they might mess it up somehow.

Golly, they might even make a cost-effective system. A low cost per MIPS is what IBM has always been known for in the mainframe market. It's funny how it doesn't want to play the same game in the low end.

No matter, you'll see the results of all this soon: double standards, havoc, confusion, debate. None of this would have happened if OS/2 were an 80386 operating system and were reasonably priced so that everyone used it. So ask yourself: Why were these decision made, and who is best served by chaos in a market dominated by cheap clones? IBM, that's who. It's good to see everyone going along with the program.

Welcome to the beginning of the end. Or maybe it's the end of the beginning. We'll see."

1.4 Jerry Pournelle

1.4.1 The Users Guide To Small Computers (NY: Baen Enterprises, 1984)

1.4.2 "Chaos Manor: A Taxing Day" Byte July '87 pp264ff

TEXT

". . . Clones of Your Own?

The other day Pam McQuesten, who used to be the managing editor of BYTE, called, and while we were chatting she said, "I got a new

computer. An AT clone."

"What kind?" I asked.

"I think it's Korean."

There's a lot of that going around, and appropriately, Edwin Rutsch has written an interesting book on the subject: The IBM XT Clone Buyer's Guide (Modular Information Systems, 432 Ashbury St., San Francisco, CA 94117, (415) 552-8648). Rutsch advocates getting a low-cost Asian XT clone and tells you most of what you ought to know if you decided to do that. I highly recommend the book to anyone contemplating getting a computer, whether or not you're contemplating a clone.

Clones aren't for everyone. There are advantages to getting an American brand name machine, like Zenith or Kaypro. First, these machines have features you won't find in clones; second, they're always being updated. You can update your clone, of course, but you'll have to do it yourself; you won't be getting update notices or product support. In clone buying as elsewhere, Pournelle's rule applies: If you don't know what you're doing, deal with people who do. But a book like Rutsch's may be enough to let you know what you're doing.

Rutsch's book is now a bit obsolete, of course. Unless you're

really strapped for money, it's worth the extra cost to get an AT compatible rather than an XT, since ATs are more easily upgradable to use the 386. Rutsch claims he'll have a new edition on AT clones about the time this is in print; it would be worth checking with him and getting the updated book before buying anything.

Of course, the real question is, what's the future of 16-bit 386 systems like Compaq's now that IBM has announced their new 32-bit bus? Should you buy a clone, or wait, and if you do get a clone, what kind?

That's not easy to figure, but one thing is certain; there are a lot of 16-bit users out there. Microsoft isn't about to abandon them, and even if Microsoft were crazy enough to leave all those customers hung out to dry, someone will keep their operating systems up to date [Note: a la CP/M to ZCPR3, do we really want that?].

Actualky, I know for a fact that in addition to the vanilla OS/2 that IBM will market, Microsoft is working on the marriage of Windows to what used to be called ADOS and is developing it all on Compaq 386 machines with Cheetah memory boards.

Thus, if you need a machine now, a clone is a good idea; and given the current situation, I'd look at the Standard 286-II [Note:

that's a brand name] with Cheetah card. It's fast, seems reliable, and is pretty certain to be supported for a few more years.

Your Move, Big Blue

What's more interesting is what IBM intends.

The other day I was handed an advance copy of some IBM documents intended for their dealers. Close inspection raises some interesting questions.

First: IBM says they'll have IBM Standard OS/2 in the first quarter of 1988; and in the final quarter of 1987 they will announce when IBM Extended OS/2 will be available. Both these products are given the formal "IBM" designation in the document. Meanwhile, DOS 3.3 is available now, and "customers whose needs will continue to be satisfied by applications for DIS in the single application environment may wish to continue using DOS 3.3." Elsewhere though it says that "DOS 3.3 offers an interim operating system for customers who wish to move to IBM OS/2." Whether that's a hidden message for Microsoft stockholders is a bit hard to tell.

I heard a low-grade rumor that the IBM Extended OS/2 won't be offered by Microsoft at all; it will be purely an IBM product. The enhancements include database management, communications

management, and a bunch of other stuff. This is supposedly the way IBM will fight the clones.

I don't know. What's certain is that IBM is far more interested in selling mainframes than PCs, and their new line is designed to fit into a mainframe environment better than into small businesses. We may not be seeing so very much of Charlie Chaplin in the future.

It's hard to tell what the future of the 386 will be because as I write this, the developers can't get fully functional 386 chips; which goes a long way toward explaining why 386s are mostly being used on 16-bit buses as fast 286s. there used to be a joke in the industry: the 286 would fulfill all the promises of the 8086, the 386 would be a good 286, and we wouldn't have real 386s until the 486 came out. That doesn't seem so funny any longer.

Something else that isn't so funny is that the IBM Extended OS/2 sounds a lot like Concurrent DOS 5.0---and I already have that running on my big CompuPro machines. In a year, IBM may catch up to what my Golem can do now."

1.4.3 "Chaos Manor: On the Road to Karlsruhe" Byte Nov '87 pp234ff

TEXT

" . . . Where To from Here?

My experiences with the Kaypro 386 reminded me of some hard questions raised about the upcoming Microsoft OS/2 during the Borland Languages Conference---about which, more later.

Borland is, of course, a competitor to Microsoft, but only in languages; Philippe Kahn is adamant about not getting into operating systems. "We'd have to work with IBM," Kahn says, "and that's pretty difficult and takes a lot of time. The IBM way is completely different from how we do things. At Borland we have teams of three or four programmers, that's how we get things done, not by putting dozens of people on jobs so that everything gets messed up. We're primarily a language house, and we want to stay that way."

Now that Borland has "merged" with Ansa (Kahn has more than 50 percent of the stock in the combined companies), that attitude may change a bit. It may even be that Philippe was testing the water; but the fact is that we all ought to be asking some hard questions about OS/2 and what's going to happen in the future.

I've looked at this before, so I won't spend a lot of time on it here. Briefly, the issue is this: OS/2 is already about 400K bytes in size and runs most single applications slower than DOS 3.2. If we add at least one 800K program (a major purpose of OS/2 is to

break the 640K-byte boundary) and a couple of 300K-byte programs (we're also told we need OS/2 because we need multitasking), we're up to at least 2 megabytes. Multitasking also needs speed, which probalby means a 386 chip.

Programmers aren't fond of EGA color because the EGA chip set doesn't have readable registers: your program can't be sure what mode the screen is in, and thus it's not only possible, but likely, that the software will make some mistakes. IBM has announced that it will not support EGA, meaning that OS/2 probably won't, menaing that you'll need a new video card---and unless you bought a MultiSync or other mutiple-format-compatible monitor, you'll need to replace the monitor as well.

If we're going to modify the hardware that much in order to OS/2, why must we bother with an operating system written for the interim 80286 chip? Why not go directly to an operating system written in 386 native code and be done with it? The 286 is doomed, and within a year, there won't be many new systems using it; the 386 will be with us for a long time. Why not have an operating system that uses the 386 as something more than a nonbuggy, faster 286?

The second issue is multitasking. I've always been opposed to multiuser systmes. Quite early in the microcomputer revolution, I proclaimed Pournelle's Law: One user, at least one CPU. It is now,

I think, time to emphasize the "at least one" aspect of that law, because, deep down inside, we don't want to share CPU cycles with anyone, even ourselves.

Most people don't really need multitasking, because most of us don't actually run two jobs at once. We need the ability to get a bunch of different programs quickly and easily, which is to say we need the ability to keep lots of memory-resident programs on-line. SideKick started as a luxury and ended up as a necessity, and I have no doubt that in the next year or so there will be more programs we just can't do without.

I've already got more desirable memory-resident programs than I can handle: CompuPro's ARCNET network software, Microlytics' wonderful Gofer file finder, Logitech's Logimouse driver, Ready! (for jotting down notes in structured form), and, of course, SideKick itself. There are others that would be enormously convenient to have on-line: units conversion programs, a file comparator, Microlytic's Word Finder thesaurus (which at the moments loads in with Q&A Write, but which would be blooming convenient to have available all the time), and so forth.

Then there are the developments in CD-ROMs. Grolier's Encyclopedia is more useful as a demonstration than as a real reference work, but Microsoft's Bookshelf with Bartlett's Familiar Quotations, the U.S. ZIP Code Guide, The American Heritage

Dictionary, The Chicago Manual of Style, and a partridge in a pear tree would get a lot of use if I could callk it up instantly. Micromedex, the medical reference CD-ROM service, is terrific; part of its interface reside in memory.

Even as I write this, a number of companies are putting other references onto CD-ROMs. Things like the Handbook of Chemistry and Physics, which I now have to reference by going across the room to the stand that hold that 16-pound monster, the Van Nostrand Encyclopedia of Science. Also becoming available are dictionareis of physics, biology, chemistry, and the like.

Those are all things I use now, and I'm sure it won't be long before I can get CD-ROM reference works I need but at present have never heard of. What I want now is a memory-resident utility that will read whatever CD-ROM I put into the Amdek reader; except that I couldn't use it if I had it, because I don't have enough memory room.

What I really want is a coprocessor board that will link my CD-ROM reader to my main system.

I can even identify a needed product: a modem board that has on-board a CPU, memory, and a communications program as good as Crosstalk in ROM. The notion is that the communications stystem

would run in the background without tying up---or even stealing cycles from---the main machine.

The fact is that what everyone wants is not multitasking, with its inevitable slowing of what you're doing in the foreground, but multiprocessing, with more than one CPU on the system bus. Note that CompuPro, with its system master and slave boards, has had that capability all along; the only thing lacking is a truly effective operating system designed around multiprocessing.

OS/2 will come out with great fanfare, and I suppose a lot of copies will be sold. Zenith, among other companies, has announced its readiness to support both PS/2 and OS/2. There will be extreme pressure to make it the new standard of the microcomputer industry. That pressure might even succeed.

If so, the success will be temporary. OS/2 isn't what we need and can't possibly be the wave of the future. The real wave of the future is in multiprocessing. Sooner or later someone will realize that and bring out a 386 native-code operating system that can accommodate multiple processors.

Incidentally, of the major computer languages, Modula-2 is the only one that has multiprocessing built into its very structure.

What Do We Do Now, Coach?

OS/2 is coming out in three phases. First, there will be OS/2 1.0, available before the end of this year; this is a character (not graphics) -oriented 80286 multitasking operating system that's supposed to run most---not all existing DOS applications. It's very Xenix-like. It comes on seven floppy disks and will cost \$325.

After that will come OS/2 1.1, which is OS/2 with the Presentation Manager, which really means OS/2 with Windows. It's said to be 550K bytes now, and since it has to have generic graphics window management, it will probably contain everything but the kitchen sink; I wouldn't be surprised if it ran to nearly a megabyte by the time it's released. No one knows when we'll get it, but the guesses are early to mid-1988. It will be another \$325.

Finally, there will be OS/2 Extended, which may or may not use Presentation Manager from 1.1, and which will cost about \$700. It should be available around January 1989. This will have communications and database management incorporated into the operating system. No one knows how large it will be, but I'd be amazed if it could do all that in less than a megabyte. It may be larger than Unix.

The question is, how much of this do we need?

For the moment, none of it: what we have is good enough for the software now available. Microsoft's policies regarding OS/2 software developers are interesting, but I haven't heard that there has been a terrific payoff. Some developers like OS/2 a lot, or say they do, but I know of no significant applications programs that require OS/2 to operate.

Developers will want OS/2 1.0; I don't know anyone else who will need it. The rest of us can wait for OS/2 1.1.

By the time 1.1 comes out, we'll have a better idea of whether we need it or not; there will also be rivals. The main rivals will be DESQview 386 and Microsoft Windows 386.

DESQview 2.0 (for the 286) is already useful. Learning it is something between a hobby and a career, but it gives you great flexibility. Most of DESQview's problems go away once you understand what it's doing; for example, you need to set up most memory-resident programs so that they run in their own windows and only in the foreground: if they are told to run in the background, it not only does no good at all, it slows down the foreground task. There are other tricks, but once learned, the system is better with DESQview than without.

Quarterdeck is busily writing a 386 version of DESQview that

doesn't force the system into virtual mode.

An even more exciting possibility is Microsoft Windows 386; I haven't seen it, but from what I've heard, it will do just about everything OS/2 1.1 can do, except run programs larger than 640K bytes. At the moment, there aren't any programs that need more than 640K bytes (although some do strange things with overlays to get around the limit). There may be some monsters that big that we can't live without, but let's wait and see. We can already access data areas larger than 640K bytes through extended and expanded memory, and it isn't really very hard to write 386 programs that will do it even better.

In other words, my advice is: 'Don't panic.' By the time OS/2 is a real alternative, we'll know more about what we may need it for.

Meanwhile, I am certain there will be a lot of software for the 386 using DOS 3.2, and that won't go away for a long time.

I would be careful about buying stuff that's specific to EGA; if you're buying a new monitor, you'll probably want one that can handle a variety of formats.

Other than that, though, if you need a machine now, get one; it's pointless to wait. We'll have 386 machines with our present DOS

for a long time, no mattter what happens with OS/2.

Generic and clone 286 ATs will be upgradable with Cheetah 386 board, if nothing else. government purchasers can get the Z-248 at a good price, and Zenith has already poroposed their 386 upgrade kit to extend their government contract. In my experience, Zenith is a good buy because the company never leaves customers hung out to dry.

At Micro Europe, Zenith announced a new video board that supports everything from monochrome through VGA---including EGA---so even that part of the upgrade won't be a problem; the board will work in non-Zenith machines. I haven't seen it yet, so this is an announcement, not an endorsement."

1.5 P Freiburger, M Swaine Fire In the Valley (Berkeley, CA:Osborne/McGraw-Hill, 1984)

1.6 Greg Fisher, Advent Products, Interview (11/16/87)

1.7 Derek McKay, Plu*Perfect Systems, Interview (11/16/87)

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